

CLAIMS

1. A communication apparatus in a wireless communication system having a base station, comprising:

5           a part which autonomously forms a zone which is a service area of said base station.

2. A communication apparatus in a wireless communication system having a base station, comprising:

10           a part which detects that a zone is newly formed around said base station; and

          a part which autonomously changes a zone which is a service area of said base station according to a newly formed zone.

15           3. The communication apparatus as claimed in claims 1 or 2, further comprising:

          a part which detects a congestion state of a surrounding base station of said base station; and

20           a part which enlarges a zone which is said service area of said base station according to said congestion state to the direction of said surrounding base station.

4. The communication apparatus as claimed in claims 1 or 2, further comprising:

25           a part which determines said zone of said base station on the basis of receive quality of a signal received from a surrounding base station of said base station.

30           5. The communication apparatus as claimed in claim 4, further comprising:

          a part which measures received power or transmission delay of a signal sent to said base station from a surrounding base station;

35           a part which calculates a distance between said base station and said surrounding base station on the basis of a result of the measurement;

          a part which determines said zone which is

said service area of said base station on the basis of the result of calculation.

6. The communication apparatus as claimed in claim 4, further comprising:

5 a part which measures a bit error rate or a packet error rate from information sent from said surrounding base station to said base station; and

a part which determines said zone which is said service area of said base station according to  
10 a result of the measurement.

7. The communication apparatus as claimed in claims 1 or 2, further comprising:

a part which detects a service content of a surrounding base station by said base station; and  
15 a part which determines said zone which is said service area of said base station such that the same services as said service do not overlap in the same service area.

8. The communication apparatus as claimed in claims 1 - 7, further comprising:

a part which autonomously determines which pattern is used in which a plurality of patterns of said zone which is said service area of said base station are prepared.

9. The communication apparatus as claimed in claim 1, further comprising:

a part which determines said zone of said base station on the basis of a first distance between said base station and a zone edge of a  
25 surrounding base station, and a second distance between said base station and a zone edge of said base station when transmission power of said base station is smallest.

10. The communication apparatus as claimed in claim 9, further comprising:

a part which determines said zone of said base station on the basis of a distance between said

base station and a zone edge of a surrounding base station in which said first distance becomes minimum in surrounding base stations except particular surrounding base stations in which a value obtained by subtracting said first distance from said second distance becomes larger than a predetermined value.

11. The communication apparatus as claimed in claim 9, further comprising:

a part which determines said zone of said base station as a zone formed when transmission power of said base station is minimum if there is a surrounding base station in which a value obtained by subtracting said first distance from said second distance is larger than a predetermined value.

12. The communication apparatus as claimed in claim 9, further comprising:

a part which determines said zone of said base station on the basis of a distance between said base station and a zone edge of a surrounding base station in which said first distance becomes minimum in surrounding base stations except particular surrounding base stations in which a value obtained by subtracting said first distance from said second distance becomes larger than a predetermined value, when beam width of an antenna used by said base station exceeds a predetermined angle; and

a part which determines said zone of said base station as a zone formed when transmission power of said base station is minimum if there is a surrounding base station in which a value obtained by subtracting said first distance from said second distance is larger than a predetermined value, when beam width of an antenna used by said base station does not exceed a predetermined angle.

13. The communication apparatus as claimed in claim 9, further comprising:

a part which obtains said first distance

as a value calculated by subtracting the size of a zone of said surrounding base station from a distance between said base station and said surrounding base station;

5           and obtains said distance between said base station and said surrounding base station from received power of a signal at said base station sent from said surrounding base station and transmission power of said surrounding base station.

10           14. A wireless communication system including a plurality of base stations, said wireless communication system including at least a particular base station as only a part of said plurality of base stations, said particular base station including a part which autonomously forms a zone of a service area of said particular base station on the basis of receive quality of signals received from surrounding base stations.

15           15. An autonomous zone forming method of forming a zone which is a service area of a base station in a wireless communication system having said base station, said method comprising the step of:

                    autonomously forming said zone.

20           16. An autonomous zone forming method of forming a zone which is a service area of a base station in a wireless communication system having said base station, said method comprising the steps of:

25                     detecting that a zone is newly formed around said base station; and

                    autonomously changing a zone which is said service area of said base station according to a newly formed zone.

30           17. The autonomous zone forming method as claimed in claims 15 or 16, further comprising the steps of:

detecting a congestion state of a  
surrounding base station of said base station; and  
enlarging a zone which is said service  
area of said base station according to said  
5 congestion state to the direction of said  
surrounding base station.

18. The autonomous zone forming method as  
claimed in claims 15 or 16, further comprising the  
step of:  
10 determining said zone of said base station  
on the basis of receive quality of a signal received  
from a surrounding base station of said base station.

19. The autonomous zone forming method as  
claimed in claims 15 or 16, further comprising the  
15 steps of:  
detecting a service content of a  
surrounding base station by said base station; and  
determining said zone which is said  
service area of said base station such that the same  
20 services as said service do not overlap in the same  
service area.

20. The autonomous zone forming method as  
claimed in claim 15, further comprising the step of:  
determining said zone of said base station  
25 on the basis of a first distance between said base  
station and a zone edge of a surrounding base  
station, and a second distance between said base  
station and a zone edge of said base station when  
transmission power of said base station is smallest.

21. The autonomous zone forming method as  
claimed in claim 20, further comprising the step of:  
determining said zone of said base station  
on the basis of a distance between said base station  
and a zone edge of a surrounding base station in  
35 which said first distance becomes minimum in  
surrounding base stations except particular  
surrounding base stations in which a value obtained

by subtracting said first distance from said second distance becomes larger than a predetermined value.

22. The autonomous zone forming method as claimed in claim 20, further comprising the step of:

5       determining said zone of said base station as a zone formed when transmission power of said base station is minimum if there is a surrounding base station in which a value obtained by subtracting said first distance from said second  
10   distance is larger than a predetermined value.

23. The autonomous zone forming method as claimed in claim 20, further comprising the steps of:

15       determining said zone of said base station on the basis of a distance between said base station and a zone edge of a surrounding base station in which said first distance becomes minimum in surrounding base stations except particular  
20   surrounding base stations in which a value obtained by subtracting said first distance from said second distance becomes larger than a predetermined value, when beam width of an antenna used by said base station exceeds a predetermined angle; and

25       determining said zone of said base station as a zone formed when transmission power of said base station is minimum if there is a surrounding base station in which a value obtained by subtracting said first distance from said second  
30   distance is larger than a predetermined value, when beam width of an antenna used by said base station does not exceed a predetermined angle.

24. The autonomous zone forming method as claimed in claim 20, further comprising the steps of:

35       obtaining said first distance as a value calculated by subtracting the size of a zone of said surrounding base station from a distance between

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